

REMARKS/ARGUMENTS

Claims 1-20 are pending. Claims 1, 7, and 13 have been amended to more clearly claim the present invention. No new subject matter has been added with the amendment to these claims.

35 U.S.C. § 103(a) - Claim 1-20 – the AAPA, the Akram patent, and the Cha patent

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as being obvious over the Applicants' Admitted Prior Art (hereinafter "the AAPA") in combination with U.S. Patent No. 5,766,982 issued June 16, 1998 to Salman Akram and James Wark (hereinafter "the Akram patent") and U.S. Patent No. 6,242,798 issued June 5, 2001 to Gi-Bon Cha and Byeong-Duck Lee (hereinafter "the Cha patent") (Office Action, pages 2-5).

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Independent claim 1 (from which claims 2-6 depend), independent claim 7 (from which claims 8-12), and independent claim 13 (from which claims 14-20) have been amended to clarify that the underfill material is dispersed by capillary action. Support for this amendment can be found in the specification at page 9, lines 9-12.

The Office Action relies on the AAPA (i.e., the background section of the present application) for a teaching of a flip chip attached to a substrate with an underfill material dispersed therebetween. Although the AAPA refers to capillary action to draw underfill from an edge of a flip chip, the Office Action at page 4 admits that the AAPA fails to disclose forming a through hole extending from the substrate first surface to the substrate second surface and disposing the underfill material through the through hole.

The Akram patent teaches placing a hole through the substrate and dispensing an underfill material therethrough. However, the Akram patent does not teach or suggest the underfill material being dispersed by capillary action, as presently claimed. In fact, the Akram patent teaches away from dispersing by capillary action, as it teaches tipping the assembly in order get the underfill material to flow between the microelectronic die and the substrate. In fact, the figure that the Office cites (i.e., FIG. 5) uses a dam 40 to prevent the flow of the underfill material from between the substrate and the microelectronic die. Clearly, the Akram patent neither teaches nor suggest dispersing the underfill material by capillary action.

A teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellants' disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). A showing of a suggestion, teaching, or motivation to combine prior teachings "must be clear and particular." *In re Dembiczak*, 175 F.3d 994, 50 U.S.P.Q.2d 1614 (Fed. Cir. 1999). The Applicants could find no teaching or suggest within the Akram patent nor the AAPA to combine the references in a manner which would render the presently claims obvious.

The Cha patent is relied upon for teaching "that epoxy can be applied from the top down

through a through hole instead of injected upward.” It was assumed that the Examiner was referring to claims 7-12 and 20, as they are the only claims that contain such a limitation. However, the Cha patent also does not teach or suggest to dispersing the epoxy material by capillary action.

Furthermore, “[i]n order to rely on a reference as a basis for rejection of an applicant’s invention, the reference must either be in the field of applicant’s endeavor or, if not, then be reasonably pertinent to the particular problem with which the invention was concerned.” In *re* Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992) (See M.P.E.P. 2141.01(a)). The Cha patent involves a different field of endeavor, as it is merely encapsulating a wirebonded chip with an encapsulation material. The Cha patent teaches dispensing an encapsulant material (i.e., epoxy resin) into what is in essence a closed container (see FIG. 4A of the Cha patent). The presently claimed invention is a flip-chip configuration wherein there is a gap around the periphery of the flip-chip microelectronic die, not a “closed container”, as shown in the Cha patent. Thus, with such a gap, conventional wisdom would assume that dispensing the underfill material with the microelectronic die gravitationally below the substrate would result in the underfill material running out of the gap and dripping from the microelectronic die. Thus, it should be clear that encapsulating a wirebonded chip in a closed container is a different endeavor from dispensing the underfill material as described in the present invention.

Thus, as neither the AAPA, the Akram patent, nor the Cha patent teach or suggest the presently claimed invention, Applicant respectfully requests reconsideration and withdrawal of the Section 103(a) rejection of claims 1-20 are respectfully requested.

In view of the foregoing remarks, the Applicants request allowance of the application. Please forward further communications to the address of record. If the Examiner needs to contact the below-signed attorney to further the prosecution of the application, the contact number is (503) 712-1682.

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Respectfully submitted,



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